KORNILOV, S.A.

Reflex klystrons as regenerative microwave amplifiers. Trudy LIP no.194:14-25 '58. (MIRA 11:11)
(Klystrons)

AUTHOR: Kornilov, S.A.

TITLE: Some results of an experimental study of metal-glass multiplier klystrons

PERIODICAL: Referativnyy zhurnal, Fizika, no. 6, 1962, 14, abstract 6Zh97 ("Sb. tr. XIII Leningr. nauchno-tekhn. konferentsii, posvyashch. dnyu radio". Leningrad 1959, 94 - 103)

TEXT: Results of a study and experimental investigation on multiplier klystrons with a multiplication coefficient 10, an output power ~50 mW and an efficiency of the order of tenths of a per cent (frequency of the tenth harmonic ≈ 3,000 Mc) are reported. Designs comprising input gaps with and without grids are discussed; some considerations are set forth in favor of the latter, which have better parameters.

[Abstracter's note: Complete translation] D. Petrov

Card 1/1

AUTHORS: S.A. Kornilov and O.N. Kazbekova SOV/109- - -4-3-18/38

TITLE: Detection in the Cathode Circuit of an Under-Excited Reflex Klystron (Detektirovaniye v katodnoy tsepi nedovozbuzhdennogo otrazhatel'nogo klistrona)

PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 3, pp 475-481 (USSR)

ABSTRACT: It was suggested by the author, Kornilov, in 1955 (Ref 6) that the envelope of a high-frequency signal which is amplified by a klystron can be detected directly in the cathode circuit of the klystron tube. The circuit for this purpose is very simple, as can be seen from Fig 1. The detected signal is taken from a resistance R which is connected into the cathode circuit of the tube; the klystron performs the function of a regenerative amplifier as well as the detector. The problem of employing this type of detection was investigated experimentally at frequencies of 3000 Mc/s and 10000 Mc/s. The circuits employed for the measurements are shown diagrammatically in Figs 2 and 3. From the experiments it was found that at low input signals a square detection characteristic was obtained. At large input signals a

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saturation effect was observed. The amplification coefficient of the system as a function of the cathode resistance R was measured and the results are plotted in Fig 4 for two values of the reflector voltage. The sensitivity of the detectors is illustrated in Fig 5; the axis of the abscissae represents the potential of the reflector, while the axis of the ordinates shows the sensitivity in the maxima of the "amplification regions". It was found that the threshold sensitivity of the klystron operating at the wavelength of 3 cm was 10-11 W. On the other hand the threshold sensitivity for the 10 cm klystron was 10-10 W. The mechanism of the detection in the cathode circuit can be analysed theoretically. If it is assumed that the emission current is constant and that the thermal velocities of the electrons emitted by the cathode are governed by the Maxwell distribution law, the detector characteristic can be expressed by:

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$$\Delta i = \frac{i}{2} \left(\frac{q}{kT}\right)^2 \beta^2 U^2$$

Detection in the Cathode Circuit of an Under-Excited Reflex Klystron

This formula is in good agreement with the experimental results. On the basis of the above investigation it is concluded that the use of the cathode-type detection in a klystron is quite feasible, especially in view of the fact that the threshold sensitivity is of the same order as that of a crystal detector. The input impedance of a video amplifier which is connected to the cathode circuit can be comparatively low (of the order of several thousand ohms).

Card 3/3 There are 6 figures, 1 table and 6 references, 5 of which are Soviet and 1 English.

SUBMITTED: September 7, 1957

94220

66711

SOV/109-4-8-32/35

AUTHORS: Kornilov, S.A. and Pomyatikhin, V.A.

TITLE: The Characteristics of a Frequency Multiplier Based on a Reflex Klystron

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 8, pp 1402 - 1404 (USSR)

ABSTRACT: The multiplier is illustrated in Figure 1. The bunching of the electrons in this system is done by the modulation of the reflector voltage. For this purpose, a coaxial resonator, tuned to the frequency which is to be multiplied, is connected to the gap between the upper grid of the klystron and the reflector. The harmonic of the electron current thus produced is "extracted" by a resonator connected between the grids of the klystron. This method of modulation of the electron beam permits complete separation between the input and output circuits, while employing a standard-type reflex klystron. The experiments were carried out on klystrons with external and internal resonators; the klystrons with external resonators operated in the frequency bandwidth of

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The Characteristics of a Frequency Multiplier Based on a Reflex Klystron

3 000 Mc/s, while those with an internal resonator operated in the vicinity of 10 000 Mc/s. The results of the measurements for the 3 000-Mc klystrons are shown in Figures 2 and 3. Figures 2 show the output power as a function of the reflector potential for a constant power of the input signal (P_1 = 6.4 W), and the dependence of the output power on the beam current; the klystron operated as a frequency quadruplar. Figure 3 shows the output power as a function of the multiplication factor n at the optimum reflector potential. Investigation of the frequency multiplication by means of a klystron with an internal resonator showed that at input powers of the order of 1.1 W, it was possible to obtain an output power of 0.4 mW, while the system worked as a frequency quintuplar. Photographs of the two types of the multiplier klystrons are shown in Figure 4.

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66711
SOV/109-4-8-32/35

The Characteristics of a Frequency Multiplier Based on a Reflex Klystron

There are 4 figures and 1 Soviet reference.

SUBMITTED: September 5, 1958

4

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9.4220

77788
SOV/109-5-2-21/26

AUTHORS: Kornilov, S. A., Yemel'yanov, A. F.

TITLE: Experimental Investigation of a Klystron Frequency Divider With Preliminary Bunching (Brief Communication)

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 2, pp 336-338 (USSR)

ABSTRACT: Reference is made to previous work by the first-named author (this Journal, 1958, 3, 4, 522) regarding an ordinary klystron with biharmonic resonator and a triple-grid reflex klystron. A two-fold frequency division was described in the above articles. The subject of the present work is a study of klystron efficiency for frequency division by factors higher than two. A variant of klystron divider characterized utilization of preliminary bunching at governing frequency with a regenerative reflex oscillator was selected for tests. Such a klystron type is shown in Fig. 1.

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Experimental Investigation of a Klystron Frequency Divider With Preliminary Bunching (Brief Communication)

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SOV/109-5-2-21/26

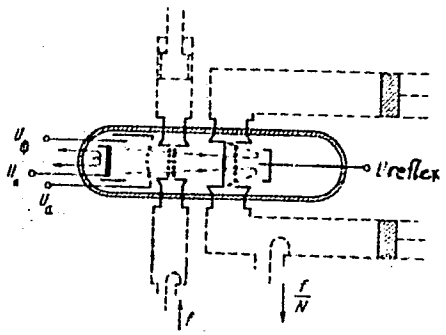

Fig. 1. Design of dividing klystron.

Frequency oscillations f, which are to be divided, enter input resonator and modulate the electron beam velocity. The bunched beam governs the regeneration process at the divider output, which

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Experimental Investigation of a Klystron Frequency Divider With Preliminary Bunching (Brief Communication)

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SOV/109-5-2-21/26

works on the principle of a reflex klystron, regenerated at a lower frequency f/N, where N is the frequency divisor. Electron beam current is controlled by the electron gun anode potential U_a. Focusing is assured by selection of an electrostatic potential (U) for the focusing ring. The klystron was designed for frequency division at 3,000 mc. The division was controlled by tuning a broad-band output resonator. The experiment used a saw-tooth voltage modulation. A two-fold division could be achieved both in auto-oscillation (synchronization) and potential (2nd type resonance) circuits. For divisors higher than 2, only synchronization could be achieved. Figure 3 shows the variation of synchronization band Δf and of synchronized oscillation power $P_{f/N}$ for N = 3 on input signal P_f power at different currents in input resonator gap. A common feature of these curves is the presence of a "ceiling".

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Experimental Investigation of a Klystron Frequency Divider With Preliminary Bunching (Brief Communication)

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SOV/109-5-2-21/26

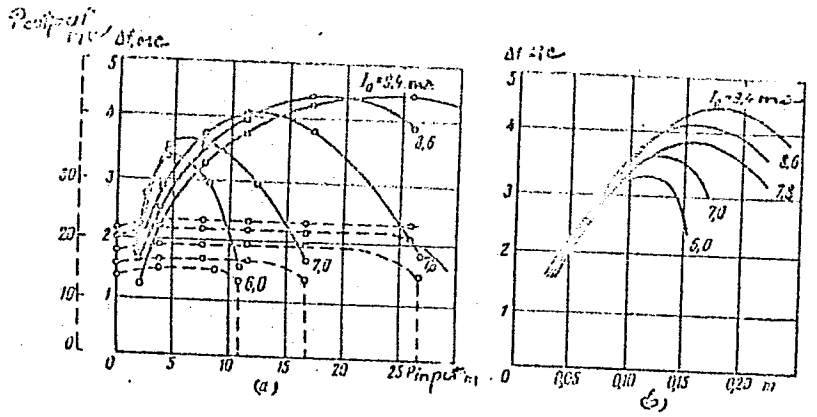

Fig. 3. (a) Dependence of synchronization band f on input power P_{in} at different currents, I_0, in klystron output gap; (b) dependence of synchronization band on modulation coefficient of beam for density m.

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Figure 3b shows the same dependences as functions of beam modulation coefficient:

$$m = X_0\left[1 - X_0\frac{(hl)^2}{12}\right]\frac{\sin hl}{hl},$$

where X_0 is bunching parameter, volume charge not dis counted; h, debunching parameter; l, length of drift. All the above-shown curves were plotted at reflector potential -20 v (in the center of oscillation zone). Practically, a ccmplete reflection of electrons was observed. Figure 4 shows the dependence of synchronization band on the divisor at retuning of the output resonator. Experimental results indicate that klystron principle can be applied sucessfully for frequency division with high divisors. As transmission coefficient of a k" tron divider is greater than 1, a cascade connection of several dividers is possible.

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Experimental Investigation of a Klystron Frequency Divider With Preliminary Bunching (Brief Communication)

77788

109-5-2-21/26

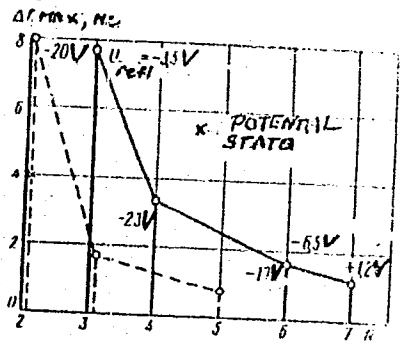

Fig. 4. Dependence of maximum synchronization band f_{max} on divisor N.

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Experimental Investigation of a Klystron Frequency Divider With Preliminary Bunching (Brief Communication)

77788
SOV/109-5-2-21/26

There are 4 figures; and 4 references, 3 Soviet, 1 U.S. The U.S. reference is: T. J. Bridges, A Parametric Electron Beam Amplifier, Proc. I.R.E. 1958, 46, 2, 494.

SUBMITTED: May 26, 1959

Card 7/7

24466
S/109/61/006/006/007/016
D204/D303

V. 4920

AUTHORS: Barmenkov, O.A., Kornilov, S.A., and Lomakin, G.V.

TITLE: A theoretical and experimental study of klystron dividers with pre-bunching

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 6, 1961, 945 - 953

TEXT: The results of experimental analysis of klystron dividers have been presented in Ye.N. Bazarov, and M.Ye. Zhabotinskiy (Ref. 2: Preobrazovaniye chastoty na otrazhatel'nom klistrone, Radiotekhnika i elektronika, 1959, 4, 2, 253); and (Ref. 3: Delen...ye chastoty na otrazhatel'nom klistrone, Radiotekhnika i elektronika 1956, 1, 5, 6, 80). In quantitative assessment of the performance of the special klystron divider as used in S.A. Kornilov (Ref. 4: Radiotekhnika i elektronika, 1960, 5, 2, 336), certain additional factors have to be taken into account. These factors were: simultaneous modulation action of the density and velocity of the beam on the process of frequency division and the influence

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A theoretical and ...

of the non-linearity of potential distribution in the retardation space. In the present article the authors give the results of a numerical analysis of the above factors and of a detailed experimental study of the klystron divider which enables an exact assessment and comparison of both theoretical and experimental data. The analysis is made for a klystron divider dividing by two. Both straight and reflex klystron dividers are analyzed concurrently. The theory of the straight klystron divider with no a.c. velocity component was presented in S.A. Kornilov (Ref. 1: Deleniye chastoty v proletnoy klistrone s vremya zazorami, Radiotekhnika i elektronika 1958, 34, 522). The theory of reflex divider with velocity modulation only has been given in Ref. 2 (Op.cit.). In the present analysis it is assumed that there is no regeneration at the first electrode. Assuming small bunching of the beam entering the regeneration region of the klystron, the authors obtain the fundamental component of divided frequency ω in which the Fourier coefficients are determined. In a straight klystron divider, the simultaneous bunching action and velocity modulation of the beam increa-

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ses the division range. The influence of the non-linearity of potential distribution in the bunching region is considered next. For a reflex klystron the bunching angle $\theta_{o2b} = a\theta_{o2}$ should be introduced. Since in practice the coefficient of bunching increase a can be made easily much larger than unity, the non-linear potential distribution could be used to decrease the required input power to the klystron divider. This can be done provided that the electron stream be velocity modulated at the input of the regeneration region. The experimental part is then described using a reflex klystron frequency divider, the construction of which is shown in Fig. 2. The picture of equipotential line distribution (for ± 2 % supply voltage variation) and the electron trajectories are shown in Fig. 3. Point A corresponds in this picture to the boundary of the grid of the 3rd diaphragm, B - to that of the fifth. To determine the value of the amplification of the bunching coefficient, trajectories 2-I. 2-II and 2-III were constructed and by graphical integration the transit time of electrons along these characteristics have been evaluated. The value obtained for "a"

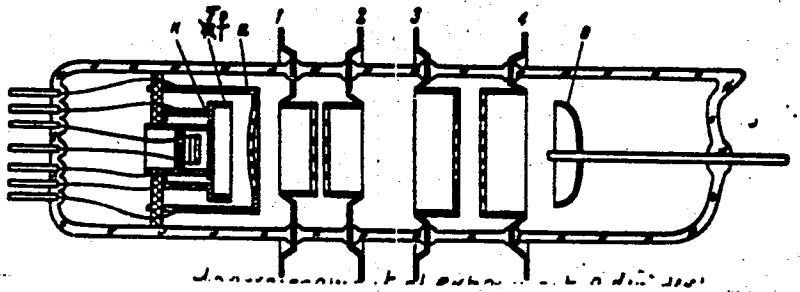
was a = 6.4. The study of static current flow has confirmed the assumption that in working conditions the beam has a very small convergence, its diameter varying between 7 mm at the output and 8 mm at the input. To evaluate the accuracy of experimental determination of parameters of bunching, theoretical and experimental evaluation of the magnitude of the optimum parameter, for the klystron working as an amplifier, was determined. The discrepancy did not exceed 15 %. The theoretical and experimental amplitude characteristics of the divider are given graphically; they are in good agreement. Finally the resonance characteristics of division are shown, the amplitude of HF voltage and its phase being drawn against frequency at the input. It is pointed out that the present article refers only to a divider dividing by two. The characteristic of a klystron performing multiple frequency divisions are given in Ref. 4 (Op.cit.). There are 7 figures and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: D. Hamilton. J. Kuper, J. Knipp, Klystrons and microwave triodes, N.Y., 1948.

A theoretical and ...

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M.I. Kalinina (Leningrad Polytechnic Institute im. M.I. Kalinin)

SUBMITTED: July 28, 1960

Fig. 2. The arrangement of experimental divider: k, f, a - cathode, focussing ring and anode of electron gun respectively; 1, 2, 3, 4, - diaphragms; o - reflector.



Card 5/6

30306
S/109/61/006/011/021/021
D201/D304

9,4220

AUTHORS: Kornilov, S.A., and Lavrov, V.M.

TITLE: Measuring the power of amplitude fluctuations in a reflex klystron

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 11, 1961, 1941 - 1942

TEXT: The simplest method of measuring the amplitude fluctuations of SHF generators is by direct detection. Because of the small SHF powers involved, only semiconductor diodes may be used. Their use is limited in the low frequency end by noise. In the present short communication preliminary results are given of measuring amplitude fluctuations of a reflex klystron within the frequency range of fluctuations 5 to 200 kc/s. The coherent method of measurement was used at 3 cm wave-length range. The analyzed SHF oscillations are channelled in a bridge circuit into 2 channels. After detection the fluctuations are amplified and applied to a switch which forms at the output either the sum or difference of channel voltages. If the

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Measuring the power of amplitude ...

analyzed generator is not modulated by noise, then the in- and out-of-phase channels will have the same indicated power (since the channel noise is incoherent). If the generator is amplitude modulated - a coherent component will appear in both channels which determine the power difference of the two channels. Ferrite switches are used in the bridge detector arms for good decoupling of channels. In the experiment the decoupling was not less than 50 db. The pass-band of the filter was 300 c/s at frequencies between 5 and 20 kc/s and 2 kc/s between 20 and 200 kc/s. The time constant of the power meter integrating meter was adjustable to give a 1 % error in noise power measurement. A ferrite SHF modulator was used for balancing the installation (proper amplitude and phase at the channel outputs whithin the narrow pass band of the filter). The results show that in the center of the fluctuation frequency range the level of noise modulation is lower than that at both ends of the range. Especially high level noise was observed with detuning towards the high frequency end. The result obtained at 200 kc/s are in agreement with those obtained by V.N. Nikonov (Ref. 4: Izv. vuzov MVO SSSR (Radiofizika) 1959, 2, 6, 915). The variation in the

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S/109/61/006/011/021/021
D201/D304

Measuring the power of amplitude ...

noise level is thought to be due to errors in calibration. In reality it is said to have a nearly constant spectrum, as shown by C. S. Aitchison (Ref. 6: Proc. I.E.E., 1958, B105, suppl. N. 12, 944). There are 2 figures and 6 references: 2 Soviet-bloc and 4 non-Soviet-bloc. The references to the 4 most recent English-language publications read as follows: R. Mueller, IRE. Trans, 1954, ED-1, 4, 42; W. Gottshalk, IRE, Trans., 1954, ED-1, 4, 91; N. Smith, Proc. I.E.E., 1958, B105, Suppl. N. 11, 800; C.S. Atichison, Proc. I.E.E., 1958, B105, Suppl. N. 12, 944.

SUBMITTED: May 10, 1961

Card 3/3

30434
S/109/61/006/012/009/020
D246/D305

9.4220 (1052, 1331)

AUTHOR: Kornilov, S.A.

TITLE: Combinational noise in transient klystron

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 12, 1961
2017 - 2027

TEXT: The author investigates the effect of current fluctuations in the projector and voltage fluctuations of the stimulator. Given that the input of a double-resonator klystron is an oscillation $U \sin \omega_c t_1 + V(t_1)$, where $V(t_1)$ is a random component of the voltages; the electron current is $I_0 + i(t_1)$ and its speed $v_0 + v(t_1)$, where $i(t_1)$ and $v(t_1)$ are the fluctuating components. Using the Levellin-Peterson equations as initial conditions, the author obtains the following expression for the spectrum of the convection current:

$$F_T(\omega) = I_0 e^{-j\omega T_0} \sum_{(n)} J_n\left(\frac{\omega}{\omega_c} X\right) \int_{-\frac{T}{2}}^{+\frac{T}{2}} \left[1 + \frac{1}{2\pi} \int_{-\infty}^{+\infty} f_T(\omega') e^{j\omega' t_1} d\omega'\right] e^{-j(\omega - n\omega_c)t_1} dt_1, \quad (7)$$

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Combinational noise in transient ...

where $X = M_1 U \omega_c T_0 / 2U_0$ - group parameter and $f_T(\omega') =$

$$f_T(\omega') = \int_{-\frac{T}{2}}^{+\frac{T}{2}} \beta(t_1) e^{-j\omega' t_1} dt_1$$

is the spectrum of $\beta(t_1)$;

$$\beta(t_1) = \frac{i(t_1)}{I_0} + j\omega T_0 \frac{M_1 V(t_1)}{2U_0} + j\omega T_0 \frac{M_1 V_n(t_1)}{2U_0} + j\omega T_0 \frac{v(t_1)}{r_0}. \quad (6)$$

From (7) one can calculate the spectral density of the r.m.s. convection current. For the practical case, the autnor investigated it around frequency $N\omega_c$, where N - multiple of a harmonic, filtered on the output; deriving then

$$\frac{g_{i\phi}(\omega)}{I_0^2} = \tau \left(1 + \frac{X^2}{12}\right) N^2 p^2 g_u + \quad (12)$$

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$$+\frac{1}{1+\left(2Q_1\frac{\delta\omega}{\omega_c}\right)^2}\left[(q^2g_V+s^2g_N)\xi_1(NX)+2Q_1\frac{\delta\omega}{\omega_c}psg_N\xi_2(NX)\right]. \qquad (12)$$

where

$$\xi_1(NX)=J_{N-1}^2(NX)+J_{N+1}^2(NX);$$

$$\xi_2(NX)=J_{N-1}^2(NX)-J_{N+1}^2(NX);$$

After analyzing (12), the author discusses 2 cases of practical interest. First, noise electron beam "near" (10^4 - 10^5 c/s) the carrier. For this he obtains

$$\frac{g_{i\Phi}(\omega)}{J_0^2}\simeq\left[\left(1+\frac{X^2}{2}\right)N^2(\Theta_1-\Theta_0)^2+\xi_1(NX)\left(\frac{M_1^2\Theta_0\Theta_1R_1}{2R_0}\right)^2\right]\frac{(4-\pi)kT_N}{2R_0}. \qquad (15)$$

where $\upsilon_0=\omega_cT_0$, $\Theta_1=\omega_cT_1$. Second case: Noise bands at tens of megacycles from carrier. Then the author analyzes some numerical examples: a) Frequency multiplier klystron; b) Two-contour amplifying klystron; c) Cascade klystron operated in synchronized tuning. Finally, the following conclusions can be made: 1) More powerful kly-

Combinational noise in transient ...

strons give a better power signal-to noise ratio; 2) Low temperature cathodes are preferable; 3) In amplification, the narrow-band noise is the main factor. In construction, one should aim at minimum conventional noise current, exciting the input resonator; 4) For the case of frequency multiplication with high tuning, a combination of θ_1 and θ_o should be found which gives minimum noise.

There are a number of other types of noise, but not analyzed in the paper, which should be taken into account when designing a tube. There are 7 figures and 4 non-Soviet-bloc references. The references to English-language publications read as follows: V.J. Norris, The frequency-multiplier klystron, J. Electronics, 1956, 1, 5, 477; M.O. Bryant, S.P. Lea-Wilson, Some experiments on broad-band c-w klystron at x-band, J. Electronics and Control, 1959, 6, 6, 481; F.M. H. Robinson, Microwave shot noise in electron beam and the minimum shot noise factor of TWT and klystrons, J. Brit. Instn. Radio Engrs., 1954, 14, 2, 79.

SUBMITTED: March 24, 1961

Card 4/4

KORNILOV, S.A.

Combination noise in a transit klystron. Radiotekh. i elektron. 6 no.12:2017-2027 D '61. (MIRA 14:11)
(Klystrons--Noise)

S/194/62/000/006/147/232
D201/D308

9.4220

AUTHOR: Kornilov, S.A.

TITLE: Some results of experimental study of glass-metal klystron multipliers

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 6, 1962, abstract, 14, 6Zh97 (Sb. tr. XIII Leningr. nauchn.-tekhn. konferentsii, posvyashch. dnyu radio. L. 1959, 94-103)

TEXT: The results of development and of experimental analysis of klystron multipliers are given. The multipliers had a multiplication factor of 10, output power of about 50 milliwatts and efficiency of the order of tenths of one percent (the frequency of the tenth harmonic about 3000 mc/s). Constructions of klystrons having an input gap with and without a grid are discussed; some considerations in favour of the latter type, as having better parameters, are given. [Abstracter's note: Complete translation.]

Card 1/1

KORNILOV, S.A.

Low-frequency modulation noise in a transit klystron.
Radiotekh. i elektron. 8 no.11:1881-1891 N '63.
(MIRA 17:1)

L 10279-63 EWT(1)/BDS--AFFTC/ASD
ACCESSION NR: AP3001130 S/0108/63/018/006/0062/0070

52

AUTHOR: Karatetskiy, S. S.; Kornilov, S. A.; Khatskevich, Ye. I. Members of the Society (see Association)

TITLE: Potentialities of the coherent method of measuring low-frequency fluctuations in low-power SHF oscillators 25

SOURCE: Radiotekhnika, v. 18, no. 6, 1963, 62-70

TOPIC TAGS: SHF oscillator; measuring SHF fluctuations

ABSTRACT: In measuring low-frequency fluctuations by means of a crystal detector, the post-detector amplifier receives (a) measurand fluctuations and (b) crystal noise whose spectral density, at frequencies under 10 sup 4 or 10 sup 5 cps, is inversely proportional to the frequency. Effect of the crystal noise can be eliminated in a two-channel instrument that permits segregating the coherent from the incoherent noises. Such a system was used by Nikonov (Izvestiya vuzov MVSSO, seriya "Radiofizika ", vol 2, no. 6, 1959) for measuring fluctuations in a reflex klystron within 40 mc down to hundreds kc. Potentialities of the two-channel method are analyzed mathematically in the article. Errors inherent to the method are considered, and the maximum sensitivity of the method is determined in terms of detector and measuring-circuit parameters. Orig. art. has: 10 formulas and 4 figures.

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L 10279-63
ACCESSION NR: AP3001130

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im. A. S. Popova (Scientific and Technical Society of Radio Engineering and Electrocommunications)

SUBMITTED: 19Oct61 DATE ACQD: 01Jul63 ENCL: 00

SUB CODE: CO, SD NO REF SOV: 002 OTHER: 003

Card 2/2

L 54559-65 EWT(l)/EWG(m)/EWA(h) Pab

ACCESSION NR: AP5015250 UR/0286/65/000/009/0034/0034
621.314.26

AUTHOR: Kornilov, S. A.

15
B

TITLE: Electronic frequency converter. Class 21, No. 170551

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 9, 1965, 34

TOPIC TAGS: frequency converter, reflex klystron

ABSTRACT: The proposed converter of electrical oscillations in the microwave range utilizes a reflex klystron to improve reliability and reduce sensitivity to overloading. To achieve heterodyning and mixing of oscillations simultaneously, the converted signal is fed to a resonance system and an i-f voltage is picked off from the electrodes of the cavity reflector. Orig. art. has: 1 figure. [DW]

ASSOCIATION: none

SUBMITTED: 21Sep61 ENCL: 00 SUB CODE: EC

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4028

Card 1/1

L 3805-66 EWT(1)/EWA(h) JM
ACCESSION NR: AP5017660 UR/0109/65/010/007/1244/1249
621.385.623.4

AUTHOR: Kornilov, S. A.

TITLE: Amplitude and phase fluctuations in a klystron due to general initial noise

SOURCE: Radiotekhnika i elektronika, v. 10, no. 7, 1965, 1244-1249

TOPIC TAGS: klystron

ABSTRACT: Formulas are developed for calculating the energy spectra of amplitude and phase fluctuations at a klystron output which are due to r-f current and velocity noise of the electron beam. Initial conditions are specified as energy spectra of arbitrarily correlated fluctuations of current and velocity. In addition to the shot noise, the current-distribution noise and input-resonator thermal noise are also allowed for. The formulas hold true for large signal-bunching parameters. The entire problem of calculating the output fluctuations is subdivided into these two steps: (1) The initial noise conditions are determined by

Card 1/2

L 3805-66
ACCESSION NR: AP5017660

calculating the conversion of cathode fluctuations in the gun accelerating field and in the input-anode drift space; also, the current-distribution noise is calculated; (2) Conversion of the beam r-f noise into output amplitude-and-phase fluctuations, with the klystron operating under nonlinear conditions, is calculated. The above method is suitable for multiplying and amplifying klystrons including the cascade types. Orig. art. has: 2 figures and 22 formulas.

ASSOCIATION: none

SUBMITTED: 22May64 ENCL: 00 SUB CODE: EC

NO REF SOV: 002 OTHER: 002

Card 2/2

L 21753-66 EWT(l)/EWA(h) JM

ACC NR: AP6004893 SOURCE CODE: UR/0057/66/036/001/0163/0173

AUTHOR: Kornilov, S. A.

ORG: Leningrad Polytechnic Institute im. M.I.Kalinin (Leningradskiy politekhnicheskiy institut)

TITLE: On the spectral line width of a reflex klystron

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 1, 1966, 163-173

TOPIC TAGS: reflex klystron, line width, low frequency, spectral energy distribution, Fourier transform, line broadening, phase analysis

ABSTRACT: The effect of low frequency amplitude and phase fluctuations on the line width of a reflex klystron is calculated with secondary emission and current distribution fluctuations as well as flicker effect and low frequency beam noise taken into account. The amplitude and phase are averaged over a period of the high frequency oscillations, and the oscillation equations for the usual equivalent circuit for a reflex klystron are transformed as by V.N.Nikonov (Izv. vyssh. uch. zav., Radiofizika, 2, No. 6, 1959) and linearized. After a detailed discussion of the physical significance of the different terms the equations are solved with the aid of a Fourier transform and the spectral energy density is calculated. "Natural" and "technical" broadening are distinguished. Natural broadening is that due to those components of the frequency fluctuations, the spectrum of which is considerably broader than the value of the spectral density at zero frequency. Technical broadening arises from those

Card 1/2 UDC: 621.385.6

L 21753-66
ACC NR: AP6004893

components of the fluctuation whose spectral density increases significantly as the frequency approaches zero; its magnitude accordingly depends on the duration of observation. A numerical example is worked out for a klystron with a Q of 400, a cathode current of 20 mA, and a reflector potential of 300 V operating at 10^{10} Hz. In this case the natural broadening due to low and high frequency beam noise is 0.002 and 0.05 Hz, respectively, and the technical broadening associated with the flicker effect is $27 \times T^{0.1}$ Hz, where T is the observation time in seconds. The fact that the technical broadening depends only weakly on the observation time is due to the fact that the flicker noise is nearly inversely proportional to the frequency. Owing to the fluctuations of the electronic component of the resonator impedance, the flicker effect increases the line width for all values of the transit angle. The flicker effect influences the amplitude and frequency fluctuations not only directly, but also through the current distribution and secondary emission fluctuations. These effects may be considerable, for the space charge does not tend to damp the secondary emission fluctuations, but they are difficult to determine quantitatively. The secondary emission flicker is not correlated with the cathode current flicker, and it is suggested that the lack of correlation between cathode current fluctuations and frequency fluctuations reported for a reflex klystron by C.Mosher (JEEE Trans. ED-10, No. 2, 1963) may be associated with secondary emission flicker. The quality of the power supply can considerably affect the technical line broadening; the use of batteries is recommended. Orig. art. has: 39 formulas and 5 figures.

SUB CODE: 20/ SUBM DATE: 08Apr65/ ORIG REF: 011/ OTH REF: 004

Card 2/2 ULR

ACC NR: AP6023869 SOURCE CODE: UR/0109/66/011/007/1227/1237

AUTHOR: Kornilov, S. A.

ORG: none

TITLE: Amplitude and phase fluctuations in mixing klystrons

SOURCE: Radiotekhnika i elektronika, v. 11, no. 7, 1966, 1227-1237

TOPIC TAGS: klystron, mixing klystron, SHF amplifier

ABSTRACT: Low-frequency fluctuations are theoretically investigated in a multi-resonator klystron whose first resonator is tuned to the initial-signal frequency, and other resonators, to a sum or difference (output) frequency. The small-signal conditions prevail in the first stage; the last stage may be nonlinear. The h-f current at the output of the first (mixing) stage is analyzed; the energy spectra of current fluctuations with and without the heterodyne signal are shown. Formulas

Card 1/2 UDC: 621.391.822.3:621.396.622.4

ACC NR: AP6023869

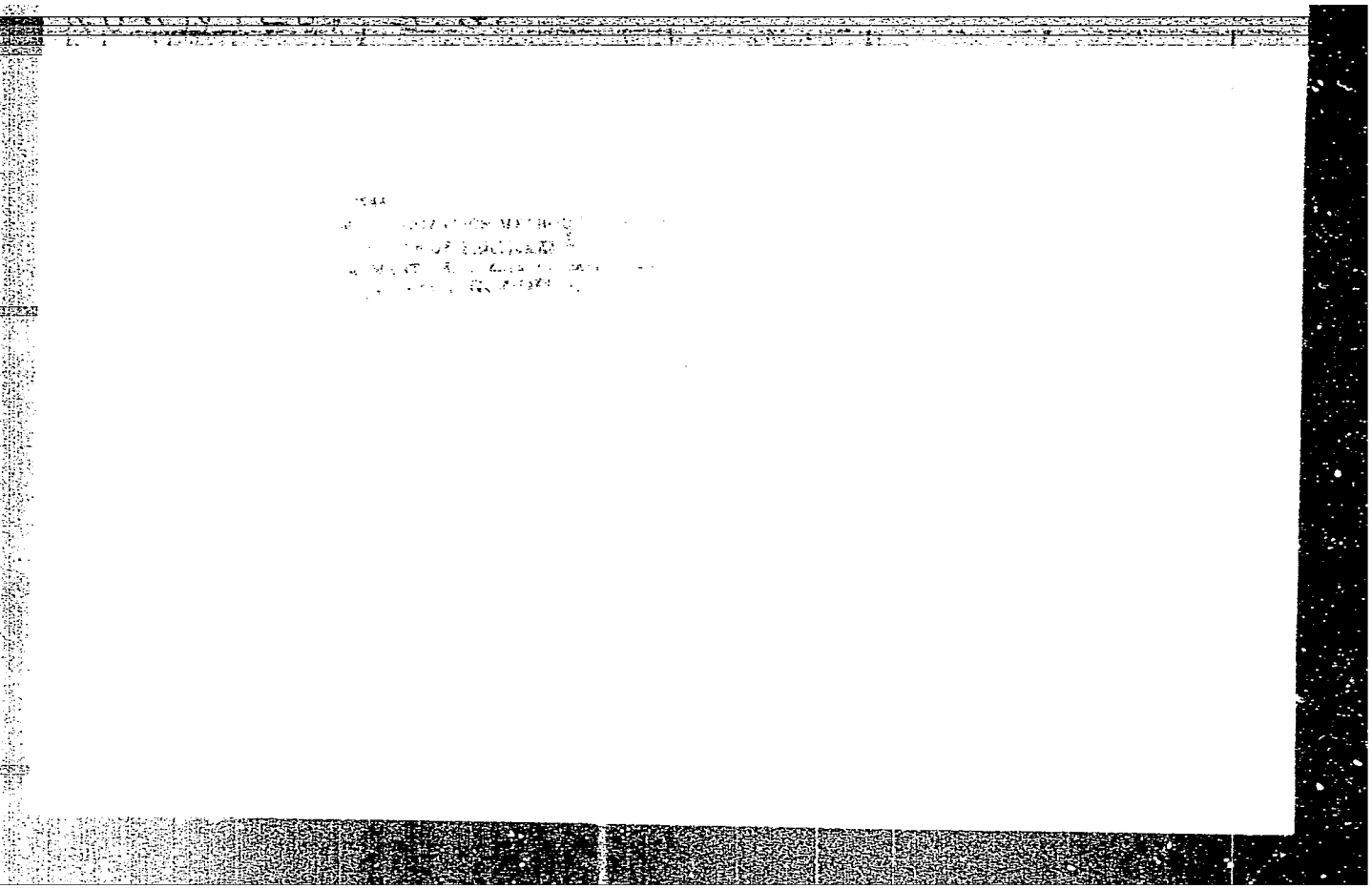
are derived for the energy spectra of amplitude and phase fluctuations due to h-f noise in the beam. Also, formulas for the energy spectra of l-f noise in the beam are deduced; transmission of signal and heterodyne fluctuations is explored. A numerical example illustrates the use of the formulas. Reducing the flicker effect by judicious selection of the transit angle is discussed (A. V. Whale, "A klystron oscillator . . . . ," 5th Intern. Congress on Microwave Tubes, Paris, 1964). Orig. art. has: 6 figures and 33 formulas.

SUB CODE: 09 / SUBM DATE: 22Mar65 / ORIG REF: 004 / OTH REF: 003

Card 2/2

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1653
AUTHOR KORNILOV,S.G.
TITLE The Polarization Method for the Measuring of the Velocities of Particles which have an Intrinsic Magnetic Moment.
PERIODICAL Žurn.eksp.i teor.fis,31, fasc.3, 512-513 (1956)
Issued: 12 / 1956

The scheme of a spectrometer for bundles of such particles is similar to the experimental system for the determination of the magnetic moments of insulated particles. In the path of the bundle there are, in the following order, a polarizator, a device for rotating the polarization plane, an analyzer, and finally a particle detector. The device for the rotation of spin can be adjusted for the action of particles of only a certain energy. The analyzer removes the remainder of the particles. The recordings of the detector correspond to the number of particles with a certain energy in the spectrum of the bundle. For neutral atoms with a magnetic moment the spectrometer (here for reasons of accuracy for particles with spin 1/2) can be constructed as follows: The atom bundle is split up into two components by an inhomogeneous field of the STERN-GERLACH type. The re-orientation device then turns the spin of the atoms with given velocity. Hereupon the particles pass through another STERN-GERLACH field, which is similar to the first, so that the two components of the bundle become spatially separated.
The spectrometer for neutrons can contain ferromagnetic polarizers: the re-orientation device consists of a system of conductors with a current which



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65722
SOV/139-59-2-21/30

AUTHOR: Kornilov, S.G.

TITLE: A Resonance Method for the Measurement of Particle Velocity in Beams

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 2, pp 140-146 (USSR)

ABSTRACT: A new method is described for measuring the velocity of free particles based on resonance reorientation of spins in a periodic magnetic field. The method is applicable to neutral particles having an intrinsic magnetic moment. A phlarized beam of particles enters a device which rotates the plane of polarization and then enters an analyzer which transmits only those particles whose plane of polarization has been rotated; the particles are recorded by a detector. If the reorientating device can be constructed so that it will rotate the plane of polarization only of particles having a given velocity, then only these particles will be recorded by the detector. In the case of molecules (groups of atoms or single atoms) having energies of the order of a few Kev, the beam may be polarized by a Stern-Gerlach magnetic field in which an incident beam is split into a number of

Card 1/4

paramagnetic gas. When the above principle is used for neutrons, the slow neutrons are polarized by passing them through a ferromagnetic (Ref 2). In the case of fast neutrons, nuclear scattering may be employed (Ref 3). An important part of the apparatus is the reorientating device. It is based on the precession of spins in a magnetic field perpendicular to the direction of polarization. In practice, the reorientating device can be in the form of a system of conductors carrying currents which produce the magnetic field which is periodic along the particle trajectory. Typical forms of such conductors are shown in Fig 2 and 3, in which the beam is assumed to be travelling in the horizontal direction. Design calculations have been carried out for such systems and conditions for resonance spin reorientation have been found. It is not stated whether the apparatus has actually been built. Acknowledgments are made to Professor P.V.Golubkov, B.M.Zamorozkov, M.A.Kovner and A.S.Shekhter for valuable advice. There are 3 figures

Card 3/4

KORNILOV, V.

KORNILOV, V. "The Stalingrad tractor," (An essay) Slavyane, 1949, No. 5, p. 47-52

SO: U-5240, 17Dec53, No. 25, 1949).

KORNILOV, V.

Lights over Drisvyaty. Vokrug sveta no.9:2-5 S '53. (MLRA 6:10)
(Drisvyaty region, Lithuania--Electrification)
(Electrification--Drisvyaty region, Lithuania)

KORNILOV, V.

Gliders depart from the auto-tow takeoff. Kryl.rod. 7 no.8:10-11 Ag '56 (MLRA 9:12)

1. Komandir zvena TSentral'noy planernoy shkoly Dobrovol'nogo Obshchestva sodeystviya armii, aviatsii i flotu.
(Gliding and soaring)

KORNILOV, V. A. (Veterinary Surgeon, Borisov Raion Veterinary Hospital, Minsk Oblast'), KOTEL'NIKOV, A. A. (Candidate of Veterinary Sciences), Belorussian NIVI),

"Mobile stand for the roentgen apparatus RU-760."

Veterinariya, Vol. 37, No. 9, p. 58, 1960.

KOTEL'NIKOV, A.A., kand.veterinarnykh nauk; KORNILOV, V.A., veterinarnyy vrach

Movable support for X-ray RU-760 apparatus. Veterinariia 37 no.9:58-59 S '60. (MIRA 14:11)

1. Belorusskiy nauchno-issledovatel'skiy veterinarnyy institut (for Kotel'nikov). 2. Borisovskaya rayvetlechebnitsa, Minskaya oblast' (for Kornilov).

(X-rays--Apparatus and supplies)

KORNILOV, V. A.

System for jet intraosseous blood transfusion. Probl. gemat. i perel. krovi no.1:40-41 '62. (MIRA 15:7)

1. Iz kliniki termicheskikh porazheniy (nach. - prof. T. Ya. Ar'yev) Voyenno-meditsinskoy ordena Lenina akademii imeni S. M. Kirova.

(BLOOD--TRANSFUSION)

KORNILOV, V.A.

Pressure regulator employing a relay. Gaz.prom.no.1:25 Ja '57.
(MLRA 10:1)
(Pressure regulators)

KORNILOV, V.A.

Experience in the automatization of the pipeline transportation of gas. Gaz.prom. 5 no.11:35-36 N '60. (MIRA 13:11)
(Gas, Natural--Pipelines)

DUBOVOY, L.V.; PONOMARENKO, A.G.; KORNILOV, V.A.

Plasma resonance of electrons in a magnetic field. Zhur.tekh.fiz. 32 no.7:792-797 Jl '62. (MIRA 15:8)
(Plasma (Ionized gases)) (Electrons) (Magnetic fields)

KORNILOV, V.A.

Automatic control of the EV-Z electromagnetic valve. Gaz. prom. 8 no.11:29-30 '63. (MIRA 17:11)

KORNILOV, V.D.; TUPITSYNA, A.F., redaktor; BEKKER, O.G., tekhnicheskiy redaktor.

[Mine hoist operator; textbook for technical training of workers] Mashinist shakhtnogo pod"ema. Uchebnoe posobie dlia proizvodstvenno-tekhnicheskogo obucheniia rabochikh. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1954. 228 p.(MLRA 7:11)
(Mine hoisting)

KORNILOV, Vasiliy Denisovich; KIRICHOK, Yuriy Grigor'yevich; KOZLOV, V.K., otv. red.; D'YAKOVA, G.B., red. izd-va; LOMILINA, L.N., tekhn. red.

[Principles of the safe and highly productive operation of hoists in ferrous and nonferrous metal mines] Osnovy bezopasnoi i vysokoproizvoditel'noi raboty pod"emnykh ustanovok na rudnikakh (chernoi i tsvetnoi metallurgii). Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po gornomu delu. 1961. 162 p. (MIRA 14:10)
(Mine hoisting)

GUDKOV, S.F.; IVANOV, A.K.; KORNILOV, V.F.; LUR'YE, B.I.; NALBANDYAN, A.B.; RUDENKO, P.S.

Plant test of the direct production of formaldehyde from natural gas. Gaz. prom. 8 no.4:35-39 '63.
(MIRA 17:10)

IVANOVA, N.A.; KORNILOV, V.G.

Adjustment of spider mites to mercaptophos in a cotton field. Trudy VIZR no.20 pt.1:12-17 '64. (MIRA 18:10)

KORNILOV, Vladimir Grigor'yevich; BERLIN, S.G., red.; POPOV, N.D., tekhn. red.

[Virgin soil of Galich]Galichskaia nov'. Moskva, Sovetskaia Rossiia, 1962. 71 p. (MIRA 16:2)

1. Sekretar' Galichskogo rayonnogo komiteta partii i agronom kolkhoza "XII Oktyabr'," Kostromskaya oblast' (for Kornilov).
(Kostroma Province—Collective farms)

KORNILOV, V.I. (Gorno-Altaysk)

On Lake Teletskoye. Zdorov'e 5 no.10:25 O '59. (MIRA 13:2)
(TELETSKOYE, LAKE)

SOV/137-58-7-15003

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 155 (USSR)

AUTHORS: Petrov, G.L., [redacted], V.I.

TITLE: Welding of Nickel and Monel Metal (Svarka nikelya i monel'-metalla)

PERIODICAL: Tr. Leningr. politekhn. in-ta, 1957, Nr 189, pp 123-135

ABSTRACT: The possibility of obtaining high-quality arc-welded joints between Ni and Monel metal was investigated, together with the possibility of welding of Ni to austenite steel 1Kh18N9T. Welding electrodes made of Ni nickel and NMts 2.5 Ni-Mn alloy were employed in welding of both Ni and Monel metal. The electrodes were covered with a UONII-13/45 coating and a 44/44/12 coating manufactured by Krupp. Welding of Ni to 1Kh18N9T steel was accomplished with the aid of electrodes which produced welded joints composed of metal of any of the following types: Kh30, Kh22N15, Kh20N10G6, Kh20N12GZM2F, and Ni. Ni-Mn welding rods submerged in fluxes AN-20 and BKFT were employed in the investigation of the process of automatic welding of Ni. Current, welding rate, the method of advancing the arc, and the temperature of preliminary heating - all these

Card 1/2

Welding of Nickel and Monel Metal

factors were varied in the course of the investigation. The materials investigation. The materials investigated were 4-5 mm thick. It was established that satisfactory joints may be obtained with rolled Ni stock of medium thickness if UONII-13/45 electrodes with NMts-2.5 cores are employed (σ_b=42-49 kg/mm^2; ϕ = 160-180°C). The porosity of welded Ni joints constitutes their major drawback. This condition may be remedied by employing moderate currents and rates of welding as well as procedures which tend to reduce the rate of cooling in the welding pool (longitudinal vibrations of the electrode etc.). Welded joints with mechanical properties identical to those produced by manual welding can be attained by automatic welding methods. Welding of Ni to steel 1Kh18N9T is readily accomplished by means of electrodes that produce welded joints composed of Cr-Ni austenite steel (electrodes: KTI-5; type of metal in the weld: Kh20N12GZM2F; σ_b= 46-48 kg/mm^2; rupture occurs in the vicinity of the weld). Monel sheet metal lends itself readily to manual arc welding with electrodes of the UONII-13/45 type with cores the composition of which is identical to the parent metal The welded seams do not exhibit any macroporousness and possess the following mechanical properties: σ_b=48-53 kg/mm^2, ϕ=160-180°. 1. Nickel--Welding 2. Nickel alloys--Welding 3. Arc welding--Electrodes 4. Welding fluxes--Applications

Card 2/2 V.S.

KORNILOV, V.N.

On the narrow-gauge railroad of a peat enterprise. Put' i put. khoz. 8 no.1:22 '64. (MIRA 17:2)

1. Glavnyy inzh. Kupanskogo transportnogo upravleniya.

KORNILOV, V.V., inzh.; KURPE, V.I., inzh.

Improving the design of soaking pits in blooming mills. Met. i gorno-rud. prom. no.3:69-71 My-Je 63. (MIRA 17:1)

1. Zavod "Azovstal'".

ACCESSION NR: AP4019005 S/0146/64/007/001/0152/0156

AUTHOR: Makarov, B. I.; Kornilov, V. V.

TITLE: Simple method for determining actual natural frequency and damping of vibrators of an electromechanical oscillograph

SOURCE: IVUZ. Priborostroyeniye, v. 7, no. 1, 1964, 152-156

TOPIC TAGS: oscillograph, electromagnetic oscillograph, vibrator type oscillograph, oscillograph vibrator frequency, oscillograph vibrator damping, MOV-2 oscillograph

ABSTRACT: On the nameplates of electromagnetic-oscillograph vibrators, their natural frequency of oscillations in air is indicated. The actual natural frequency — much lower than on the nameplate — can be determined from the response of a vibrator to the application of a unit step input. An oscillogram of that response shows the natural frequency and damping involved. Five vibrators of a Soviet-made MOV-2 oscillograph were investigated with these results:

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ACCESSION NR: AP4019095

Vibrator	Natural Frequency in Air, cps.	Actual Natural Frequency, cps.	Damping
VIII	1200	350—365	0,87—0,92
V	2000	1230—1240	0,71—0,73
IV	3000	730—830	0,80—0,82
II	10000	4900—5900	0,95—1,00
I	5000	1700—2300	0,69—0,95

Orig. art. has: 4 figures, 2 formulas, and 1 table.

ASSOCIATION: Ry*binskiy vecherniy tekhnologicheskiy institut (Ry*binsk Evening Technological Institute)

SUBMITTED: 01Jun63 DATE ACQ: 23Mar64 ENCL: 00

SUB CODE: EE NO REF SOV: 001 OTHER: 000

Card 2/2

MAKAROV, B.I.; KORNILOV, V.V.

Simple determination of effective frequency values and of the damping rate of oscillators of an electromechanical oscillograph. Izv. vys. ucheb. zav.; prib. 7 no.1:152-156 '64. (MIRA 17:9)

1. Rybinskiy vechernly tekhnologicheskiy institut. Rekomendovana kafedroy soprotivleniya materialov i detaley mashin.

KORNILOV, V.V.; MAKAROV, B.I.

Measurement of quick-changing temperatures in conducting solids with thermocouples. Izm. tekh. no.10:35-37 O '63. (MIRA 16:12)

KORNILOV, V.V., starshiy prepodavatel'

Theoretical and experimental determination of friction-surface temperature of a friction clutch during repeated momentary operations. Izv.vys.ucheb.zav.; mashinostr. no.5:36-41 '58. (MIRA 12:5)

1. Moskovskiy stankoinstrumental'nyy institut imeni Stalina.
(Clutches (Machinery)--Testing)

KORNILOV, V. V., Cand Tech Sci -- (diss) "Research into the thermal conditions of disk friction clutches." Moscow, 1960. 19 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Moscow Machine Tool Instrument Inst im I. V. Stalin); 150 copies; price not given; (KL, 22-60, 137)

KHARCHENKO, I.F.; FAYNBERG, Ya.B.; NIKOLAYEV, R.M.; KORNILOV, Ye.A.; LUTSENKO, Ye.A.; PEDENKO, N.S.

Investigating the interaction between an electron beam and plasma. Zhur.eksp.i teor.fiz. 38 no.3:685-692 Mr '60. (MIRA 13:7)

1. Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR.
(Electron beams) (Plasma (Ionized gases))

BM

9,3130 (1163, 1538, 1141)
24.6716

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S/057/61/031/007/001/021
B108/B209

AUTHORS: Kharchenko, I. F., Faynberg, Ya. B., Nikolayev, R. M., Kornilov, Ye. A., Lutsenko, Ye. I., and Pedenko, N. S.

TITLE: Interaction of an electron beam with a plasma in a magnetic field

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 7, 1961, 761-765

TEXT: The interaction between a beam of charged particles and a plasma has great physical and technical significance and is therefore subject to the present study. In a plasma in a magnetic field, an electron beam may interact with both E and H waves. Moreover, parameter resonance may occur since the arising waves lead to a change of the parameters which is periodical in space and time. When the frequency of the plasma particles stands in a certain ratio to the frequency of the electromagnetic field forming by self-modulation of the electron beam when moving through a plasma, parameter resonance is possible. This ratio between the frequency ω of the longitudinal waves, due to the interaction between beam and

Card 1/3

Interaction of an electron beam ...

in the beam (1800 to 3000 Mc/sec, half-width 30 - 50 Mc/sec) offer the possibility of obtaining millimeter waves by further increasing the magnetic field strength. Further results are announced to be given in a following paper. This paper was read at the Second Conference on Magnetohydrodynamics, Riga, July 1960. There are 3 figures, and 8 references: 6 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR Khar'kov (Institute of Physics and Technology AS UkrSSR Khar'kov)

SUBMITTED: October 3, 1960

Card 3/3

L 44714-66 EWT(1) IJP(c) AT

ACC NR: AP6031588 SOURCE CODE: UR/0386/66/004/004/0147/0152

AUTHOR: Kornilov, Ye. A.; Faynberg, Ya. B.; Kovpik, O. F.

ORG: Physicotechnical Institute, Academy of Sciences, Ukrainian SSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

TITLE: Spatial and temporal correlations of electric fields in a weakly turbulent plasma

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 4, 1966, 147-152

TOPIC TAGS: turbulent plasma, plasma diagnostics, electric field, autocorrelation function, spectral energy distribution, plasma beam interaction, plasma instability

ABSTRACT: The purpose of the present work was to determine the spectral energy density E_k^2 of the electric field during the transition of a plasma into a turbulent state, using as an example the simplest and most prevalent two-stream instability. This was done by measuring the spatial autocorreleation functions of the electric fields of high-frequency oscillations excited in a plasma-beam discharge. The experiment was carried out with an electron beam with energy up to 5 kev and current 20-100 ma, in a magnetic field up to 2000 G and at 10^{-4} mm Hg pressure (Fig. 1). Under these conditions, a plasma was produced with density up to 6×10^{11} el/cm^2. With the aid of a cylindrical cavity placed ahead of the interaction chamber, the beam could be modulated at a frequency of 3,000 MHz. The spatial autocorrelation function R(l) was

Card 1/2

determined by summing oscillations (600-6000 MHz) received at different points of the discharge in a quadratic detector, with subsequent time averaging. From the form of the autocorrelation function it was possible to estimate the correlation length and the spectral energy density of the electric field. Plots are presented of the spatial autocorrelation functions of the oscillations and spectral energy density of the electric field and of the temporal autocorrelation functions of the oscillations. It is deduced from an analysis of the results that the oscillations of a plasma-beam discharge have an irregular stochastic character, with the correlation length and the correlation time depending essentially on the oscillation amplitude. A decrease in the oscillation amplitude, as well as external modulation, leads to an increase in the length and time of the correlation and to a transition from irregular to regular oscillations. The authors thank V. D. Shapiro and V. I. Kurilko for a discussion of the results, A. G. Shevlyakov for help with the measurements, and L. I. Bolotin for interest and help with the work. Orig. art. has: 3 figures and 3 formulas.

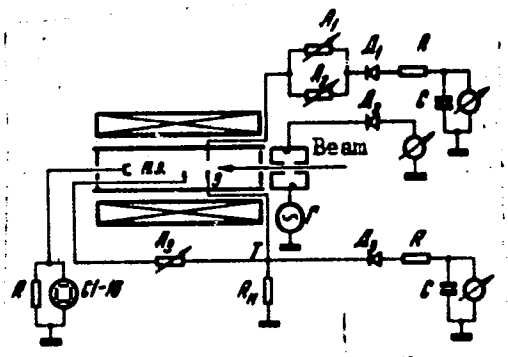

Fig. 1. Measurement scheme

SUB CODE: 20/ SUBM DATE: 11Jun66/ ORIG REF: 008/ OTH REF: 001

L 2488-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT
ACCESSION NR: AP5020720 UR/0057/65/035/008/1372/1377

AUTHOR: Kornilov, Ye. A.; Kovpik, O.F.; Faynberg, Ya. B.; Karchenko, I.F.

TITLE: Mechanism of plasma formation during development of beam instability

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 8, 1965, 1372-1377

TOPIC TAGS: plasma instability, plasma heating, plasma beam interaction, plasma oscillation, electron beam, magnetic field, air, hydrogen, argon

ABSTRACT: The authors have investigated the production of plasma by a 3-5 mm diameter 10-50 mA beam of 2-5 keV electrons traversing the 40 cm length of a 10 cm diameter glass tube containing air, argon, or hydrogen at different pressures in the presence of a 0-2 kOe longitudinal magnetic field. The plasma density was determined with Langmuir probes, with a 10 kMc/sec interferometer, and by the detuning of a 3 kMc/sec resonant cavity. Oscillations excited in the plasma were received with a dipole antenna outside the chamber and were investigated with a spectral analyzer and with resonance wavemeters. At pressures below a critical value the plasma density was close to the beam density and oscillations near the Larmor frequency were observed. When the pressure was increased through the criti-

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L 2488-66
ACCESSION NR: AP5020720

cal value the plasma density increased by two or three orders of magnitude (ionizations of 10% were achieved in argon) and oscillations were observed near the Langmuir frequency, which at the plasma densities reached was higher than the Larmor frequency. The plasma density pulsated over a range of 50% at a frequency between 10 and 100 kc/sec. In the region of instability (which is ascribed to the Cerenkov effect), the electron beam lost nearly all its energy to the plasma. The authors believe that their results together with those of L.D.Smullin and W.D. Getty (Phys. Rev. Letters, 9, 1, 3, 1962; J. Appl. Phys., 34, No. 12, 1963) indicate that with a beam of higher power there can be obtained highly ionized hot plasmas, heated by the kinetic energy of the beam. Orig. art. has: 8 figures.

ASSOCIATION: none

SUBMITTED: 26Oct64 ENCL: 00 SUB CODE: ME

NR REF SOV: 004 OTHER: 005

Card 2/2

L 2489-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT

ACCESSION NR: AP5020721 UR/0057/65/035/008/1378/1384

44,55 44,55 44,55 70 B

AUTHOR: Kornilov, Ye. A.; Kovpik, O. F.; Faynberg, Ya. B.; Bolotin, L. I.; Kharchenko, I. F. 44,55 44,55

TITLE: Time variations of high frequency oscillations during development of instability in a beam-plasma system 21,44,55

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 8, 1965, 1378-1384

TOPIC TAGS: plasma instability, plasma beam interaction, plasma oscillation, electron beam, magnetic field

ABSTRACT: The authors have continued their investigations, described in the preceding paper (ZhTF, 35, 1372, 1965; see abstract AP 5020720), of the production of plasma by an electron beam traversing a gas in a longitudinal magnetic field. The authors describe their apparatus in the preceding paper and in more detail elsewhere (Fizika plazmy i problemy upravlyayemogo termoyadernogo sinteza, Vol.4. Izd. AN USSR, Kiyev, 1964). It was found that oscillations are excited at integral multiples of half the Larmor frequency and that the width and peak frequency of the spectrum of these oscillations vary periodically at the frequency of ionic sound.

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L 2489-66
ACCESSION NR: AP5020721

The spectrum narrows with increasing pressure and broadens with increasing beam current. When the magnetic field strength is increased beyond a certain value, the oscillations cease to be continuous but come in bursts which follow each other at intervals that decrease with increasing magnetic field strength. Tilting the beam moderately with respect to the direction of the magnetic field so as to introduce a small transverse velocity component increased the amplitude of the oscillations by two orders of magnitude. The reasons for the pulsation of the oscillations at high field strengths, for the increase of the amplitude of the oscillations in the presence of a transverse electron velocity component, and for the periodic variation of the spectrum of the oscillations are still obscure. Orig. art. has: 7 figures.

ASSOCIATION: none

SUBMITTED: 26Oct64 ENCL: 00 SUB CODE: ME

NR REF SOV: 012 OTHER: 007

Card 2/2

L 06312-67 EWA(1) IJP(c) AT/GD

ACC NR: AT6020432 SOURCE CODE: UR/0000/65/000/000/0024/0035

AUTHOR: Kornilov, Ye. A.; Kovpik, O. F.; Faynberg, Ya. B.; Khrachenko, I. F.

12
B+1

ORG: none

TITLE: Investigation of particle energy and conditions of excitation of low frequency oscillations in a plasma formed by the growth of instabilities in a beam-plasma system

SOURCE: AN UkrSSR. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy (Interaction of charged particle beams with plasma). Kiev, Naukova dumka, 1965, 24-35

TOPIC TAGS: ion current, ion density, plasma interaction, plasma beam interaction, acoustic frequency

ABSTRACT: The conditions necessary for the excitation of ion currents in experiments where electron beams traverse the plasma are reported. The experiment is described and a diagram of it is given. An electron beam of 2-5 kev electrons (10-80 mA) is incident on the plasma in the magnetic field (0-2 kg) parallel to the beam. Movable analyzers were used thus permitting the interaction length of beam and plasma to be changed. Analysis of the discharge showed that ion current density across the magnetic field lines is smaller than that along the field lines. These currents could be generated only when the ambient pressure was between $4 \cdot 10^{-4}$ and 10^{-2} mm Hg. The current maximum also appears at a pressure corresponding to maximum plasma oscillations. It is also shown

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that the electron ion currents emerging from the plasma are equal to the current entering the plasma. The observation of outflowing currents has shown that for sufficiently long plasma-beam interaction length, the current from the end of the plasma consisted solely of ions. The investigation of the frequency distribution of the excited oscillations shows that the ion current arises in situations favoring the production of instabilities. The most favorable conditions for generating beams of ions with energies up to 1 kev are given. The study of excitation frequency change with electron temperature and type of gas used shows that the low frequency oscillations generated in the experiment were near the ion-acoustic frequencies. Further study of the generation of low frequencies is needed. Orig. art. has: 6 figures, 1 table.

SUB CODE: 20/ SUBM DATE: 11Nov65/ ORIG REF: 017/ OTH REF: 003

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L 06311-67 EWA(1) IJP(c) AT/GD

ples of electron cyclotron frequencies. The spectrum near the maxima changes periodically during the discharge; the time period of the change is very close to that of the ion-acoustic wave. It is shown that relative width of the spectrum narrows as the pressure increases and broadens with increase of the beam current. At magnetic field intensities higher than critical, the plasma-beam discharge was found to change to a relaxation type of wave excitation. During the excitation periods, the beam current was strongly damped indicating very strong interaction with the plasma. Orig. art. has: 5 figures.

SUB CODE: 20/ SUBM DATE: 11Nov65/ ORIG REF: 012/ OTH REF: 007

Card 2/2

KARPOV, Mikhail Mikhaylovich; POTEMKIN, A.V., dots., otv. red.; KORNILOV, Ye.A., red.; PAVLICHENKO, M.I., tekhn. red.

[Basic principles governing the development of the natural sciences] Osnovnye zakonomernosti razvitiia estestvoznaniia. Rostov-na-Donu, Izd-vo Rostovskogo univ., 1963. 300 p. (MIRA 17:3)

L 24119-66 EWT(1)
ACC NR: AP6014609 SOURCE CODE: UR/0386/66/003/009/0354/0357

AUTHOR: Kornilov, Ye. A.; Faynberg, Ya. B.; Bolotin, L. I.; Kovpik, O. F. 72 B

ORG: Physicotechnical Institute, Academy of Sciences, Ukrainian SSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

TITLE: Suppression of low-frequency oscillations in two-stream instability by prior modulation of the electron beam

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 9, 1966, 354-357

TOPIC TAGS: plasma instability, plasma oscillation, plasma beam interaction, electron beam, beam modulation

ABSTRACT: This is a continuation of earlier work (coll. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy [Interaction of Charged Particle Beams with a Plasma], p. 18, Kiev, 1965), where it was shown that development of a two-stream instability is accompanied, besides high-frequency oscillations (1000--6000 Mcs), also by low-frequency oscillations (10 kcs--30 Mcs) and by intense ion currents. To check on the cause of these low-frequency oscillations and to find methods of suppressing these oscillations, the authors experimented with an electron beam (up

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ACC NR: AP6014609

to 100 ma) of 2--5 kev particles injected into an interaction chamber situated in a longitudinal magnetic field of intensity up to 2000 oe. The experimental setup was similar to that described earlier. The results show that the low-frequency oscillations are caused by the high-frequency ones and can be suppressed by modulating the beam at a modulating frequency equal to twice the electron gyro frequency. The prior modulation of the beam suppresses also the high-frequency oscillations. The suppression efficacy increases with increasing depth of modulation. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 28Feb66/ ORIG REF: 005

Card 2/2

BRONSKIY, N.I., dots.; REZNIKOV, A.P., dots.; YAKOVLEV, V.P., aspirant; ZHDANOV, Yu.A., prof., red.; KORNILOV, Ye.A., red.; PAVLICHENKO, M.I., tekhn. red.

[V.I.Vernadskii; on the 100th anniversary of his birth] V.I.Vernadskii; k stoletiiu so dnia rozhdeniia. Rostov-na-Donu, Izd-vo Rostovskogo univ., 1963. 102 p. (MIRA 16:12)

1. Rostovskiy gosudarstvennyy universitet (for Bronskiy, Reznikov).

(Vernadskii, Vladimir Ivanovich, 1863-1945)

SOLOV'YEV, Aleksandr Ivanovich; KOSENKO, I.A., dots., otv. red.; KORNILOV, Ye.A., red.

[Theory of simple computing and measuring mechanisms] Teoriia prosteishikh schetno-reshaiushchikh i izmeritel'nykh mekhanizmov. Rostov-na-Donu, Izd-vo Rostovskogo univ., 1964. 61 p. (MIRA 18:6)

L 8564-65 EWT(l)/EWG(k)/EWA(m)-2/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2
Pz-6/Po-4/Pab-24/Pi-4 IJP(c) AFETR/AFWL/SSD/ASD(f)/ASD(a)-5/REAM(a7)/
ASD(p)-3/ASD(d)/AEDC(b)/ESD(gs)/ESD(t) AT S/0057/64/034/006/1031/1036
ACCESSION NR: AP4040306

AUTHOR: Kharchenko,I.F.; Faynberg,Ya.B.; Kornilov,Ye.A.; Pedenko,N.S.

TITLE: Excitation of oscillations in a plasma by an electron beam

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.6, 1964, 1031-1036

TOPIC TAGS: plasma, plasma density, plasma oscillation generation, plasma magnetic field interaction, electron beam

ABSTRACT: The excitation of oscillations in a plasma in a longitudinal magnetic field by an unmodulated electron beam was investigated experimentally. A 30 cm long beam of 2 to 5 keV electrons was employed with magnetic fields up to 2000 Oe. The plasma was formed by ionization of the residual gas, usually at a pressure of several microns of mercury, first by the electron beam, and subsequently by oscillating plasma electrons. Oscillations of the plasma were observed by examining the signal induced in a dipole antenna located near the apparatus, and by measuring the high frequency component of the electron beam current leaving the system. Intense oscillations were observed at frequencies close to 1.4, 1.65, 2, or 3 times the electron Larmor frequency when the electron beam energy and the magnetic field strength sat-

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ACCESSION NR: AP4040306

isfied certain conditions. When these oscillations were excited the plasma density reached a value between 5×10^{10} and 2×10^{11} cm^{-3}; the oscillation frequency was accordingly approximately equal to the electron Langmuir frequency, and the dispersion was anomalous. The intensity of these oscillations was greatest where the electron beam entered the plasma, and the signal decreased, with a double spatial periodicity, as the dipole antenna was moved along the tube in the direction of the beam. When conditions as regards the beam energy and magnetic field for excitation of these oscillations were not satisfied, oscillations at the Larmor frequency were observed. Low-frequency oscillations (several hundred Mc/sec) were also detected. The oscillations are discussed in terms of the dispersion equation derived by M.F.Gorbatenko (ZhTF 33,173,1963) for the interaction of an electron beam with a plasma. A linear theory, however, cannot account for the discrete regions of magnetic field strength (for fixed electron beam energy) required for excitation of the oscillations, and it is suggested that a non-linear coupling between electron cyclotron oscillations and plasma oscillations is involved. Orig.art.has: 5 formulas and 4 figures.

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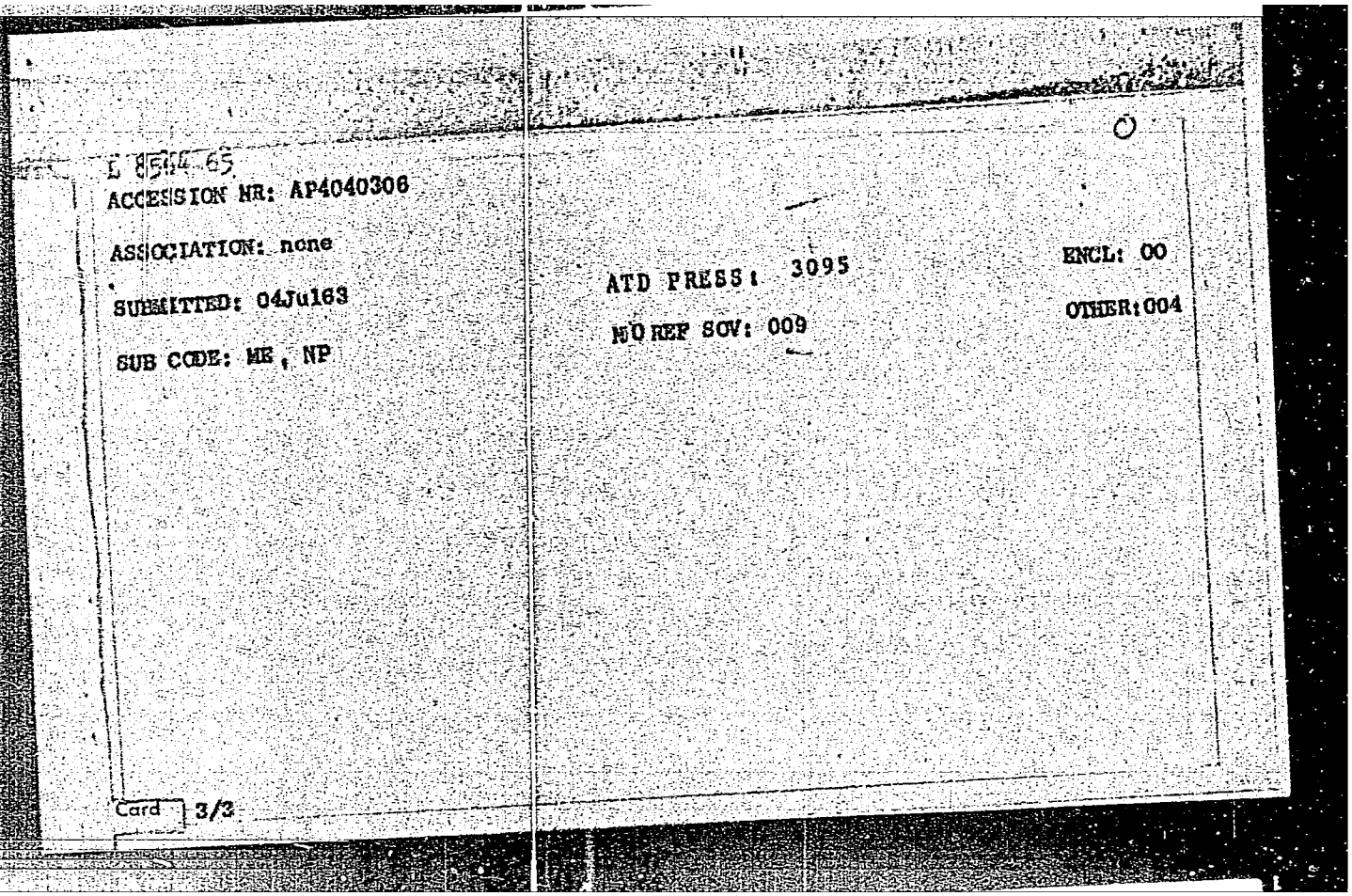

L 8514-65
ACCESSION NR: AP4040306

ASSOCIATION: none

SUBMITTED: 04Jul63

SUB CODE: ME, NP

ATD PRESS: 3095

NO REF SOV: 009

ENCL: 00

OTHER: 004

Card 3/3

POTAPOV, Igor', Ivanovich; YEGOROV, A.I., prof., otv. red.; KORNILOV, Ye.A., red.

[Geotectonics; a textbook] Geotekhnika; uchebnoe posobie. Rostov-na-Donu, Izd-vo Rostovskogo univ., 1964. 251 p. (MIRA 18:7)

KORNILOV, Yu.

In the land of people scorched by the sun. Sov. profsoiuzy 19 no.13:40-42 Jl '63. (MIRA 16:9)
(Ethiopia--Social conditions)

ACC NR: AN7003356 SOURCE CODE: UR/9018/67/000/016/0004/0004

AUTHOR: Kornilov, Yu. (Correspondent of TASS; Split-Belgrade)

ORG: none

TITLE: 4000 miles on hydrofoil [Sea-going hydrofoil ship]

SOURCE: Sovetskaya Kirgiziya, no. 16, 19 Jan 67, p. 4, col. 8

TOPIC TAGS: hydrofoil, ship, cargo ship

ABSTRACT:

A new sea-going version of the Soviet hydrofoil "Kometa" has arrived in the Yugsolav Adriatic port of Split. It has a top speed of 34 miles per hour and can carry more than 100 passengers. Its captain, V. Bogachev, said that Soviet hydrofoils are very much in demand all over the world, and that recently they have been purchased by such countries as the USA and the FRG. The Soviet export firm "Sudoimport" wishes to continue their trading but the customers must become more familiar with their vessels; therefore, this is the reason for the long ocean voyage. The Soviet vessel left Yalta and crossed the Black Sea, the sea of Marmara, and the Aegean, Ionic, and Adriatic seas to reach Yugoslavia.

SUB CODE: 13/ SUBM DATE: none/ ATD PRESS: 5113

Card 1/1 UDC: none

KORNILOV, Yu.

New features of China. Okhr.truda i sots.strakh. 3 no.3:75-77 Mr '60. (MIRA 13:7)

(CHINA--TUBERCULOSIS--HOSPITALS AND SANATORIUMS)

PUSHKAREV, V., kand. tekhn. nauk; KORNILOV, Yu., inzh.

Problems in the execution of overall engineering preparations in the area of a microdistrict. Zhil. stroi. no.5:6-9 '65. (MIRA 18:7)

KORNILOV, Yu.

Under the banner of unity. Sov. profsoiuzy 17 no.8:14-16 Ap '61.
(MIRA 14:3)

(Labor and laboring classes)
(World politics)
(Trade unions)

KORNILOV, Yu. (Gavana)

A genuine "Corona." Sov. profsoiuzy 17 no.21:45-47 N '61.
(Cuba--Tobacco industry)

KORNILOV, Yu.

In various continents. Sov.profsoiuzy 18 no.22:31-33 N '62. (MIRA 15:12)

(Trade unions) (World politics)

USSR / Farm Animals. Cattle. Q

Abs Jour : Ref Zhur - Biologiya, No 2, 1959, No. 7364

Author : Kornilov, Yu. D.; Litvyankov, A. S.
Inst : Vitebsk Zooveterinary Institute
Title : A Cheap Method of Increasing the Milk's Fat Content in Cows

Orig Pub : Sel'ska gaspadarka Belarusi, 1957, No 10, 39-40

Abstract : An experiment was conducted at the Podberez'-ye training farm of the Vitebsk Zooveterinary Institute in which the milk's fat content was raised in cows by feeding them brewer's yeast according to the method which was proposed by Professor M. Gulyy and the Academician Pshe-nichnyy. As a result of the cows being fed

Card 1/2

KORNILOV, [redacted], kand.ekon.nauk, dots.; Cheredkov, S.N., kand.vet.nauk; YAKIMCHIK, V.F., zootekhnik

Reducing the cost of artificial insemination of cows. Zhivotnovodstvo 21 no.6:23-25 Je '59. (MIRA 12:8)

1. Vitebskiy veterinarnyy institut (for Kornilov). 2. Zaveduyushchiy Vitebskoy gosudarstvennoy mezhrayonnoy stantsiyey iskusstvennogo osemeneniya zhivotnykh (for Cheredkov).
(White Russia--Artificial insemination)

BATURIN, Andrey Alekseyevich; KORNILOV, Yuriy Emanuilovich; LARICHEV, V.I., red.; RAKOV, S.I., tekhn.red.

[Facts against lies; a pamphlet] Fakty protiv lzhi; pamflet. Moskva, Izd-vo VTsSPS Profizdat, 1959. 69 p. (MIRA 12:12)
(Russia--Economic conditions)

KORNILOV, Yuriy Emmanuilovich; ALEKSEYEV, F., red.; DANILINA, A., tekhn. red.

[Meany and Reuter, servants of monopolies] Mini i Reiter-prisluzhniki monopolii. Moskva, Gos.izd-vo polit.lit-ry, 1960. 71 p. (MIRA 14:5)
(United States--Trade unions)

KORNILOV, Yu.G.

12

Ionic Temperature Regulators. U. G. Kornilov. (*[illegible] Industria* (*[illegible] Ind.*), 19[illegible], (2), 9-12). [In Russian.] A brief description. N. A.

A S M - S L A METALLURGICAL LITERATURE CLASSIFICATION

KORNILOV, Yu. G. and V. D. PIVEN

Osnovy teorii avtomaticheskogo regulirovaniia v prilozhenii k teplosilovym ustanovkam. Leningrad, Mashgiz, 1947. 307 p. diagrs.

Bibliography: p. 305-[306?].

Fundamentals of the theory of automatic control applied to steam power plants.

DLC: TJ254.K64

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

KORNILOV, G.

Apr 1947

USSR/Turbines, Steam
Controllers

"Electromechanical Boiler Controllers of the Central Boiler and Turbine Institute," G. Kornilov, 5 pp

"Kotloturbostroyeniye" No 2

Describes the construction of the controllers and discusses their operating principles, with a brief account of their adjustment. Illustrated with schematic diagrams and a photograph of a controller.

12T50

PA 187T32

USSR/Mathematics - Servomechanisms Jan/Feb 51

"Conditions Governing the Autonomicity of Continuous and Discontinuous Regulation Systems of Definite Classes," Yu. G. Kornilov, Cen Boiler-Turbine Inst imeni I. I. Polzunov

"Avtomat i Telemekh" Vol XII, No 1, pp 7-14

Following the ideas of I. N. Voznesenskiy on automatic regulation, Kornilov considers conditions governing its realization in the case where continuous-action regulators with constant-speed servomotors and discontinuous-action regulators with forced rhythm of circuit interruption are

187T32

USSR/Mathematics - Servomechanisms (Contd) Jan/Feb 51

employed, which situation is characteristic of most elec systems. Shows such regulation is possible to obtain, except where there is slippage and certain "transposition." Submitted 23 Mar 49.

187T32

KORNILOV, YU. G.

KORNILOV, Yu. G. Cand. Tech. Sci.

"Problem of Dispatching Gas to Administrations of Large Cities," a paper presented at the All-Union Conference on Telemetering and the National Economy, 29 Nov to 4 Dec 1954, Moscow.

Inst. of Gas Utilization, AS UkrSSR

M-1029, 28 Mar 56